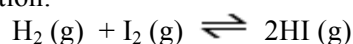


Equilibrium Questions

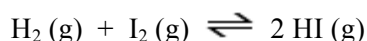
Consider the following chemical reaction:



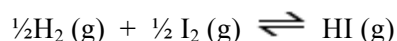
At equilibrium in a particular experiment, the concentrations of H_2 , I_2 , and HI were 0.15 M, 0.033 M, and 0.55 M, respectively.

- Write the expression for the equilibrium constant.
- What is value of the equilibrium constant?

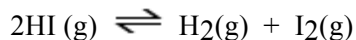
The value of K_{eq} for the equilibrium



is 794 at 25 °C. What is the value of K_{eq} for the equilibrium below?

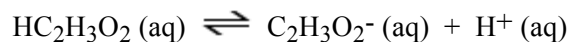


A reaction vessel is charged with hydrogen iodide, which partially decomposes to molecular hydrogen and iodine:



When the system comes to equilibrium at 425 °C, $P_{\text{HI}} = 0.708 \text{ atm}$, and $P_{\text{H}_2} = P_{\text{I}_2} = 0.0960 \text{ atm}$. What is the value of K_p ?

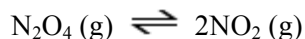
Acetic acid is a weak acid that dissociates into the acetate ion and a proton in aqueous solution:



At equilibrium at 25 °C a 0.100 M solution of acetic acid has the following concentrations:

$[\text{HC}_2\text{H}_3\text{O}_2] = 0.0990 \text{ M}$, $[\text{C}_2\text{H}_3\text{O}_2^-] = 1.33 \times 10^{-3} \text{ M}$ and $[\text{H}^+] = 1.33 \times 10^{-3} \text{ M}$. The equilibrium constant, K_{eq} , for the ionization of acetic acid at 25 °C is _____.

Dinitrogen tetroxide partially decomposes according to the following equilibrium:



A 1.00-L flask is charged with 0.400 mol of N_2O_4 . At equilibrium at 373 K, 0.0055 mol of N_2O_4 remains. What is the K_{eq} for this reaction?

At 22 °C, $K_p = 0.070$ for the equilibrium:



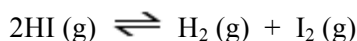
A sample of solid NH_4HS is placed in a closed vessel and allowed to equilibrate. Calculate the equilibrium partial pressure (atm) of ammonia, assuming that some solid NH_4HS remains.

The equilibrium constant (K_p) for the interconversion of PCl_5 and PCl_3 is 0.0121:



A vessel is charged with PCl_5 , giving an initial pressure of 0.123 atm. At equilibrium, the partial pressure of PCl_3 is _____ atm.

For the reaction below, $K_p = 0.0198$ at 721 K.



In a particular experiment, the partial pressures of H_2 and I_2 at equilibrium are 0.710 and 0.888 atm, respectively. The partial pressure of HI is _____ atm.